

# THE MINERAL INDUSTRY OF MEXICO

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Mexico's gross domestic product (GDP) was \$626 billion (\$929 billion in purchasing power parity). In real terms, the GDP increased slightly by 1.3% after a modest increase of 0.8% (revised) in 2002. Among the largest increases in economic activity were in the construction sector, which consumed a large portion of the industrial minerals (3.4%), and the mining sector, which included natural gas and petroleum (3.7%). Inflation decreased to 4.5% in 2003 from 5% in 2002. Although unemployment remained low at 3%, it was an increase compared with that of 2002 when it was 2.1% (Instituto Nacional de Estadística Geográfica e Informática, 2004<sup>1</sup>; International Monetary Fund, 2004<sup>§</sup>; Latin Focus, 2004<sup>§</sup>).

## Government Policies and Programs

Under the Mexican Constitution, minerals are part of the national patrimony. The Mining Law, which governs Mexico's mining industry, is under Article 27 of the Constitution. The Mining Law of 1992 became effective in September 1992 and was amended in 1996. This Law covers exploration for and production and beneficiation of minerals. The Law permits up to 100% private ownership in equity in exploration, development, and production even in commodities previously reserved for the Government, such as coal, iron, phosphorus, potassium, and sulfur. Hydrocarbons, radioactive materials, and salt that is formed by evaporation of brines from playas are some of the materials exempted from the Law.

Exploration concessions are granted for 6 years and are not renewable. Production concessions are awarded for 50 years and are renewable for a similar period. The Mining Law eliminated concessions for beneficiation plants. In February 1999, revisions to the mining regulations were published. The regulations allow increases in private sector participation of the mining companies in Mexico. The regulations decrease the administrative procedures and establish time limits for most of the procedures. The Public Service Manual of Mining-Related Issues, which was published in July 1999, established administrative procedures for all mining matters and regulations. The responsibility of the mining sector belongs to the Secretaría de Economía. The Dirección General de Minas is responsible for revisions to the Mining Law and its regulations, and granting of mining concession titles.

The Law of Foreign Investment was published in 1993 and was amended by decrees in 1995, 1996, 1998, and 1999. Its regulation was published in 1998.

## Environmental Issues

The General Law of Ecological Balance and Environmental Protection (LGEEPA), which is the key of environmental legislation, was passed in 1988. Environmental responsibility that resided in various Government agencies was transferred to the Secretaría de Medio Ambiente, Recursos Naturales y Pesca (SEMARNAP) in 1994. In 2000, the agency became the Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT).

Under SEMARNAT, mineral exploration and mining requires a number of environmental permits and authorizations to conform to the statutes of LGEEPA. These start with a preliminary environmental impact statement for all major activities of the projects. Besides an operating license, the necessary permits for any mine or plant include explosives, hazardous materials handling, land use, water discharge, and well usage. Other regulations involve such issues as dumps and tailings, electrical transformers, gas and dust emissions, noise, and storage of oil and fuel.

The regulation that governs the evaluation of environmental impact was enacted in 2000. Under the regulation, environmental impact reports for beneficiation plants, gas and oil pipelines, and mines must be authorized by SEMARNAT.

## Production

Mexico was an important mineral producer that ranked among the top world producers in a variety of minerals. Based on U.S. Geological Survey production figures, it was the world's leading producer of bismuth (with about 24% of the world's refined total). The world leader for many years in the production of mined silver, Mexico became the second ranked producer of silver (mine) in 2003 after Peru's production increased significantly and Mexico's production decreased. Mexico still, however, supplied almost 13% of the world's mined silver. Although Mexico's production of celestite increased in 2003 and Spain's production decreased, Mexico remained the second ranked producer of celestite after many years as the leading producer. Nonetheless, Mexico supplied almost 35% of the world's celestite. Mexico maintained its position as an important producer of many mineral commodities, which included cadmium, cement, copper, fluor spar, gypsum, manganese ore (metal content), molybdenum, salt, steel, sulfur, and zinc (mine).

In 2003, the value of mineral production (excluding petroleum and natural gas) was \$4.61 billion, which was a slight decrease compared with that of 2002 when production was \$4.68 billion (revised). Of the total, 55% (\$2.55 billion) was from industrial minerals, and 45% (\$2.06 billion) was from metals. Production of sand and gravel (combined) was the highest in terms of value of the total mineral production (excluding petroleum and natural gas) with \$842.5 million (18% of the total value); this was a 13% decrease

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<sup>1</sup>References that include a section mark (§) are found in the Internet References Cited section.

compared with that of 2003 when production was valued at \$969.3 (revised). Another industrial mineral whose value has increased significantly was marble; in 2003, its value totaled \$465.5, which was almost as high as that of silver (10% of the value of total mineral production). Among metals, copper ranked highest with \$578 million, which was about 28% of total metal production and 13% of total mineral production. The value of copper increased by 5% as a result of price increases during the year. Silver followed closely with a value of \$466.6 million.

## Trade

In 2003, Mexico's total exports were valued at \$164.9 billion. The value of mineral exports (excluding petroleum and natural gas) was \$3.1 billion, or 1.9% of the total. The value of metal exports totaled \$2.7 billion, or 87% of total mineral exports (excluding petroleum and natural gas). Total imports were valued at \$170.5 billion. Mineral imports (excluding petroleum and natural gas) accounted for \$2.7 billion, or 1.6% of total imports (Consejo de Recursos Minerales, 2004, p. 14-15; Instituto Nacional de Estadística Geográfica e Informática, 2004§).

During 2003, about 80% of Mexico's mineral exports went to the United States, and 46% of its mineral imports originated from the United States. In current dollars, the value of exports to and imports from the United States increased by 9% and 8%, respectively. Other important trading partners of minerals (excluding petroleum and natural gas) were Australia, Brazil, Canada, Chile, India, Japan, Spain, and Switzerland (Consejo de Recursos Minerales, 2004, p. 116, 124).

Of these minerals, iron was the largest source of foreign exchange with \$765 million, or about 25% of total mineral exports, and was followed by silver (\$590 million), gold (\$450 million), and copper (\$301 million). Industrial mineral exports were led by marble (\$119 million), natural abrasives (\$85 million), and fluorspar (\$39 million). Metal imports were led by iron with 19% of the total import value (\$507 million) followed by gold (\$265 million) and silver (\$252 million). Industrial mineral imports were led by precious and semiprecious stones (\$165 million), natural abrasives (\$67 million), and alumina (\$46 million). Coal imports were valued at \$312 million (Consejo de Recursos Minerales, 2004, p. 112, 120).

Mexico was the world's seventh ranked exporter of crude petroleum. It exported 679 million barrels of crude petroleum with a value of \$18.6 billion, which was a 25% increase in value and an 8% increase in volume compared with that of 2002. Mexico, however, was a net importer of natural gas and refinery products. Net exports totaled \$14.6 billion. The average price for Mexican crude was \$24.79 per barrel, which was a 14.7% increase compared with that of 2002. Of the total crude exports, 78% went to the United States followed by Spain (9%) and the Netherlands Antilles (6%) (Petróleos Mexicanos, S.A. de C.V., 2004, p. 45-46, 50-51).

## Structure of the Mineral Industry

Government responsibilities for the mining sector are held by the Secretaría de Economía. The Secretaría de Energía is responsible for petroleum and electricity. The Dirección General de Minería is the highest office charged with mining policies with the purpose of fostering new investment and maintaining a healthy mining sector. It is supported by the Consejo de Recursos Minerales (CRM), the Dirección General de Minería, the Dirección General de Fomento Minero, and the Fideicomiso de Fomento Minero. The CRM is responsible for integrating the inventory of Mexico's mineral resources. The main functions of the Dirección General de Minería are to award mining concessions and to maintain the national mining and mapping registers. The Dirección General de Fomento Minero is responsible for promoting the mining sector by using, for example, incentives for domestic and foreign investment in the sector. The Fideicomiso de Fomento Minero is responsible for administrative, financial, and technical assistance to the mining sector by the Government.

The Cámara Minera de México (Mexican Chamber of Mines) is another important organization in Mexico's mining sector. It promotes the interest of the private sector and maintains a dialog between the private mining sector and the Government. Other prominent mineral-related organizations include the Asociación Nacional de Fabricantes de Cal (National Association of Lime Manufacturers), the Cámara Nacional de la Industria del Hierro y el Acero (National Chamber of Iron and Steel), Federación Nacional de Mineros Pequeños (National Federation of Small Miners), and the Instituto Mexicano del Aluminio A.C. (Mexican Aluminum Institute).

In 2003, employment in the mineral sector was 247,964; this was a 3.2% decrease compared with that of 2002 and a 15% decrease compared with that of 1999. Of the total, 128,207 were employed in the manufacturing of nonmetallic mineral products; 62,610 in base-metal industries; 33,267, in the production of coal, graphite, and nonmetals; and 21,390 in the extraction and beneficiation of metals (Secretaría de Economía, 2004§). Nearly all miners were represented by the National Syndicate of Mining and Metallurgical and Similar Workers Union of the Mexican Republic. The Confederation of Mexican Workers, which was the largest Mexican union, represented the cement employees.

Four large Mexican diversified companies and a Canadian company dominated the production of nonfuel minerals (table 2). These were Empresas Frisco, S.A. de C.V., Grupo Acerero del Norte, S.A. de C.V., Grupo México, S.A. de C.V., Industrias Peñoles, S.A. de C.V., and Minas Luismin, S.A. de C.V. (a subsidiary of Wheaton River Minerals Ltd. of Canada).

Mexico's cement industry was dominated by Cementos Mexicanos, S.A. de C.V. (CEMEX), which was the world's third leading producer after LaFarge Group of France and Holcim Group of Switzerland. Cementos Apasco, S.A. de C.V. and Cooperativa La Cruz Azul, S.C.L. were other important producers of cement in Mexico.

The production of crude petroleum, natural gas, and basic petrochemicals, which were reserved for the Government under Article 27 of the Constitution, was entrusted to the State company Petróleos Mexicanos, S.A. de C.V. (PEMEX). It operated through several

subsidiaries—Pemex Exploración y Producción (Pemex Exploration and Production), Pemex Gas y Petroquímica Básica (Pemex Gas and Basic Petrochemicals), Pemex Internacional (Pemex International), Pemex Petroquímica (Pemex Petrochemicals), and Pemex Refinación (Pemex Refining).

## Commodity Review

### Metals

**Copper.**—In 2003, mine production of copper in Mexico increased by 8% to 355,653 metric tons (t). Mexico's copper industry benefited from the increase in copper prices and decrease of world inventories during the last quarter of the year and was also affected by the devaluation of the peso against the U.S. dollar. Through its subsidiary Minera México, S.A. de C.V., which included Industrial Minera México, S.A. de C.V. (IMMSA), Mexicana de Cananea, S.A. de C.V., and Mexicana de Cobre, S.A. de C.V., Grupo México led copper production with 78% of the copper mine production. The Cananea Mine, which was owned by Mexicana de Cananea and is located in the State of Sonora, was Mexico's leading producer. Cananea's output was 94,100 t of copper in concentrate and 49,500 t of copper by solvent extraction-electrowinning (SX-EW). The second ranked producer in Mexico was Mexicana de Cobre's La Caridad Mine with 107,200 t of copper in concentrate and 21,500 t of copper by SX-EW. IMMSA's polymetallic underground mines (Charcas in San Luis Potosí, San Martín in Zacatecas, Santa Barbara, and Santa Eulalia in Chihuahua) produced 23,100 t. Production from Grupo México's subsidiaries increased by 8% compared with that of 2002. Cananea had Mexico's largest copper reserves with 13.26 million metric tons (Mt) of copper recoverable by concentration and 7.46 Mt in copper recoverable by SX-EW (Grupo México, S.A. de C.V., 2004, p. 13, 16).

Industrias Peñoles, S.A. de C.V., which was one of Mexico's leading mining companies, was a small producer of copper in 2003 with less than 3% of the country's copper mine output. The company continued development of several projects that will increase its copper presence in Mexico. Its construction of the Milpillas underground copper project in the State of Sonora, which was scheduled to begin operations by the end of 2005, included making significant progress on work on the mine shaft, constructing the ramp, and completing detailed engineering work of this project. When fully operational, Milpillas will increase Peñoles's copper mine production by more than fivefold. In addition to Milpillas, Peñoles's joint venture with Chile's copper giant Corporación Nacional del Cobre de Chile (CODELCO) Minera Pecos, S.A. de C.V. continued its exploration program also in the State of Sonora. During the year, the company acquired mining rights on an additional 100,000 hectares (Industrias Peñoles, S.A. de C.V., 2004, p. 16).

**Gold and Silver.**—Mexico's mine production of gold was 20,406 kilograms (kg), which was a 4% decrease compared with that of 2002 and a 23% decrease from that of 2000 when production was more than 26,000 kg. The leading producer of mine gold was Peñoles with an output of about 10,700 kg (reported as 343,600 troy ounces), or 52% of Mexico's total. La Herradura Mine, which was owned by Minera Piedmont S. de RL. de C.V., was Mexico's leading gold mine; it produced more than 24% of Mexico's gold in 2003. Minera Piedmont was a joint venture between Peñoles (56%) and Newmont Mining Corporation (44%). La Cienega Mine, which was owned by Peñoles, was Mexico's second ranked producer of gold with more than 4,100 kg (reported as 132,216 troy ounces) (Industrias Peñoles, S.A. de C.V., 2004, p. 13, 45).

Another important producer of gold was the precious-metals company Minas Luismin. The company operated two mine units, the San Dimas Unit on the border of the States of Durango and Sinaloa and the San Martín Mine in the State of Mexico. The San Dimas Unit included the San Antonio, the Santa Rita, and the Tayoltita Mines. Production from Minas Luismin in 2003 totaled about 3,300 kg (reported as 106,900 troy ounces) (Wheaton River Minerals Ltd., 2005).

Minera Hecla, S.A. de C.V. produced almost 1,500 kg of gold from its San Sebastián Mine in the State of Durango; this production was 15% higher than that of 2002 (Hecla Mining Co., 2004, p. 4). This silver and gold mine has been in production since 2001.

In February 2003, Metallica Resources Inc. of Canada updated the mineral reserves for its Cerro San Pedro gold and silver project in the State of San Luis Potosí when it purchased 50% equity from Glamis Gold Ltd., which had been its partner in the venture. In September, the capital and operating cost study for the project was completed. The company estimated that the mine would operate for 8.5 years at a production rate of about 2,800 kilograms per year (kg/yr) (reported as 90,400 troy ounces per year) of gold and about 37,300 kg/yr (reported as 1.2 million troy ounces per year) of silver (Metallica Resources Inc., 2003).

In 2003, Mexico was the world's second ranked producer of silver, although mine production decreased by 6% to 2,569 t. The leading producing company was Peñoles, which produced 59% of the silver mined in Mexico during the year. Peñoles's silver mine production decreased mainly because of the closure of Las Torres gold and silver mine in the State of Guanajuato. Peñoles's Fresnillo (Proaño) Mine in the State of Zacatecas was Mexico's leading producer and one of the world's richest mines. Production from the mine increased by 2% to more than 995,000 kg (reported as 32 million troy ounces) (Industrias Peñoles, S.A. de C.V., 2004, p. 6, 13). Other important silver mine producers were Grupo México, which produced about 426,000 kg (reported as 13,691,232 troy ounces) of silver, most of it from its underground properties; Minas Luismin, with about 189,000 kg; and Hecla, with 127,000 kg (Grupo México, S.A. de C.V., 2004, p. 21; Hecla Mining Company, 2004, p. 4; Wheaton River Minerals Ltd., 2005).

Pan American Silver Corp. of Canada produced about 30,800 kg (reported as 991,142 troy ounces) from its La Colorada Mine in central Mexico. During the year, Pan American Silver completed the construction of a plant to process an additional 600 metric tons per day of oxidized ore at a cost of \$20 million. The mine expansion was expected to increase La Colorada's mine production capacity to 118,000 kg/yr (Pan American Silver Corp., 2003, 2004\$).

**Iron and Steel.**—Mexico was the third leading producer of iron ore in Latin America and the Caribbean (after Brazil and Venezuela). In 2003, production of iron was about 11.3 Mt. The largest iron ore mine was Peña Colorada in the State of Colima with

a 3.5-Mt production capacity. Peña Colorada was a joint venture between Hylsamex, S.A. de C.V. (through its subsidiary Hylsa, S.A. de C.V.) and Ispat International N.V. (through its subsidiary Ispat Mexicana, S.A. de C.V.). In addition, Hylsa owned three other iron ore mines through its company Las Encinas, S.A. de C.V. These three mines had a production capacity of 1.5 million tons per year (Mt/yr), although two of the mines closed in 2001 (Hylsa, S.A. de C.V., 2004, p. 35).

Mexico, which was the second ranked producer of steel in Latin America and the Caribbean, produced about 26% of steel in the region. Total production capacity was 18.9 Mt (Cámara Nacional de la Industria del Hierro y del Acero, 2004). Production of direct-reduced iron and pig iron increased by 15% and 5% to 5.5 Mt and 4.2 Mt, respectively, for the second consecutive year. Similarly, steel production increased by about 8% to 15.2 Mt. The improvement in the steel market was because of the increase in demand from the Asian (Chinese) market and the beginning of the recovery of the U.S. economy, especially after the third quarter (Hylsamex, S.A. de C.V., 2004, p. 2). Ispat Mexicana, S.A. de C.V. (IMEXSA) was the leading producer with about 24% of the total steel produced in Mexico. Hylsa and Altos Hornos de México, S.A. de C.V. (AHMSA) were tied for second place, each producing 19% of the total (Hylsa, S.A. de C.V., 2004, p. 41). The apparent consumption of steel products increased by 7% to 15.9 Mt (Cámara Nacional de la Industria del Hierro y del Acero, 2004).

**Lead and Zinc.**—Mexican mine production of lead was 139,348 t; this was an increase of less than 1% compared with that of 2002. The largest producer continued to be Peñoles with about 58% of the total. Naica, which was located in the State of Chihuahua, was Peñoles's (and Mexico's) leading producing mine with an output of about 46,200 t (Industrias Peñoles, S.A. de C.V., 2004, p. 6). IMMSA produced 25,900 t of lead from four of its mines. Santa Barbara, which is also located in the State of Chihuahua, was IMMSA's largest producing mine with 15,900 t (Grupo México, S.A. de C.V., 2004, p. 24).

Mine production of zinc in Mexico decreased by 7% to 413,991 t compared with that of 2002. Grupo México (through IMMSA) and Peñoles produced about 90% of Mexico's mined zinc. Peñoles continued to be the leading producer with 57% (235,120 t). Francisco I. Madero was Peñoles's largest zinc mine with 35% of the company's output. The decrease in the production of lead and zinc was due, in part, to Peñoles's closure of El Monte Mine in the State of Hidalgo. Peñoles output was also affected by the collapse of a previously mined area in the Francisco I. Madero Mine (Industrias Peñoles, S.A. de C.V., 2004, p. 14).

Grupo México produced 33% of Mexico's mined zinc in 2003. Almost 50% of the company's production was from the Charcas Mine (Grupo México, S.A. de C.V., 2004, p. 18).

**Manganese and Ferroalloys.**—During the year, production of manganese (metal content of ore produced) increased by almost 30% to 114,550 t. Minera Autlán, S.A. de C.V. produced battery-grade manganese dioxide, ceramic-grade manganese dioxide, manganese carbonate, manganous oxide, and oxide nodules. The company had three ferroalloy plants in Mexico. In these plants, the company produced medium- and low-carbon ferromanganese and silicomanganese. In 2001, Minera Autlán was forced to close two of its ferroalloy plants (Gomez Palacio and Tezuítlan) temporarily because of its financial difficulties and increased imports. The Gomez Palacio plant remained closed in 2003. The company was delisted from Mexico's stock market. In 2003, the company was able to reduce its debt significantly by restructuring and to increase its production of ferroalloys by more than 20% (Minera Autlán, S.A. de C.V., 2004a, b).

### *Industrial Minerals*

**Fluorspar.**—Mexico, which was the world's second ranked producer of fluorspar after China, produced about 16% of the world's total. Fluorspar production increased by almost 22% compared with that of 2002. The State of San Luis Potosí was the leading producer with more than 80% of the country's production (Consejo de Recursos Minerales, 2004, p. 453).

**Cement.**—Mexico's production was estimated to be 32 Mt. The leading producer of cement in Mexico was CEMEX with 15 plants. In addition to CEMEX, two of the other world leaders in cement production, the Holcim Group and the Lafarge Group, had plants in Mexico. In 2003, Lafarge announced that it was building a new 600,000-metric-ton-per-year (t/yr) cement plant in the State of Hidalgo. The new plant will replace an existing high-cost 350,000-t/yr plant. The new plant was expected to be completed by 2006 and would cost an estimated \$120 million (Lafarge Group, 2003).

### *Mineral Fuels*

**Coal.**—Production of coal decreased by less than 1% to 11.3 Mt. All the coal produced in Mexico was from the State of Coahuila. The principal producer was Minera Carbonífera Río Escondido, S.A. (a subsidiary of Altos Hornos de México, S.A. de C.V.) from two open pits and three underground deposits in Nava.

**Natural Gas.**—Mexico was the 16th ranked producer of natural gas. In the Americas, only the United States, Canada, and Argentina, in that order, produced more natural gas than Mexico (BP p.l.c., 2004a). Production of gross natural gas increased by less than 2% in 2003 compared with that of 2002 and production of marketed natural gas was estimated to have increased by less than 3%. The Cantarell Field, which is located in the Region Marina Noreste (northeastern offshore region) was Mexico's leading producing field with almost 17% of the country's total (Petróleos Mexicanos, S.A. de C.V., 2004, p. 2).

Because of increased demand from the power sector, Mexico has been increasing imports of natural gas from the United States. In an effort to decrease imports of natural gas and to meet increased demand by the power sector, the Mexican Government planned to increase the production of nonassociated gas through Multiple Service Contracts with the private sector. In July 2003, the Government opened the first bids for seven areas. Five of the seven areas were awarded to several firms, which included Repsol-YPF S.A. of Argentina (the Reynosa-Monterrey block) and Brazil's Petróleo Brasileiro S.A. in a joint venture with Grupo Diavaz of Mexico

and Teikoku Oil of Japan (the Cuervito and Fronterizo blocks) and the Argentine firm Tecpetrol S.A. in partnership with the Mexican company Industrial Perforadora de Campeche (the Mision block). With this and other measures, the Government planned to increase natural gas production to about 227 million cubic meters per day (reported as 8 billion cubic feet per day) by 2008 (U.S. Energy Information Administration, 2004§).

**Petroleum.**—Mexico was the world's fifth ranked producer of crude oil. In the Americas, only the United States produced more crude petroleum than Mexico (BP p.l.c., 2004§b). Production of crude and condensate in 2003 increased by about 6% after a 1% decrease in 2002 compared with that of 2001. Mexico had 4,941 producing wells (351 more than in 2002). More than 80% of Mexico's crude petroleum was produced from offshore wells. The Cantarell oilfield, which was Mexico's largest field, produced 62% of Mexico's total production. Heavy crude accounted for 72% of the production. Light and super-light crude were about 15% and 13% of the total, respectively. Of the total crude distributed, 55% was sent to export terminals, and 37% went to domestic refineries; the petrochemical plants received 4%, and the maquiladora industry received 3% (Petróleos Mexicanos, S.A. de C.V., 2004, p. 16, 18-19).

Mexico planned to increase its crude production by almost 20% (reported as 4 million barrels per day) by 2006 while replacing 75% of the reserves. PEMEX estimated that investments of \$61 billion (\$45 billion in exploration and production and \$16 billion in refinery upgrade) would be necessary to meet those goals. In 2003, the Government of Mexico announced two multibillion dollar projects—plans for the development of the Chipontepce Field and the Marine Platform Building Program, which would add 47 platforms, 178.6 kilometers of pipelines, and other facilities to develop the Ku-Maloob-Zaap and other projects. At completion, these are expected to produce 1.5 million barrels per day of crude and almost 42.5 million cubic meters per day (reported as 1.5 billion cubic feet per day) of natural gas (Energy Information Administration, 2004§).

**Refinery Products.**—In 2003, PEMEX had six refineries in operation. Refinery production increased by about 1% compared with that of 2002. Mexico was a net importer of refinery products. The country has been upgrading its refinery system to improve the quality of gasoline and to expand the system's production capacity. Reportedly, the upgrade will change Mexico from depending on imports of gasoline and distillates to becoming a net exporter of those products in 2004. Upgrading two of its refineries (Minatitlán and Veracruz) would reduce fuel imports by 27% and upgrading the Salina Cruz refinery could eliminate the need to import gasoline (World Refining, 2003; U.S. Energy Information Administration, 2004§).

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TABLE 1  
MEXICO: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	1999	2000	2001	2002	2003
<b>METALS</b>					
Aluminum, metal:					
Primary	62,736	61,200	51,500	39,000	--
Secondary <sup>c</sup>	362,866 <sup>3</sup>	350,000	350,000	350,000	350,000
Total	425,602	411,200	401,500	389,000	350,000
Antimony:					
Mine output, Sb content	126	39	--	--	--
Metal <sup>3</sup>	273	52	81	155	434
Arsenic <sup>4</sup>	2,419	2,522	2,381	1,946	1,729
Bismuth:					
Mine output, Bi content <sup>5</sup>	548	1,112	1,390	1,126	1,064
Metal, refined	412	1,083	1,390	1,126	1,064
Cadmium:					
Mine output, Cd content	1,311	967	1,245	1,609	1,616
Metal, refined	1,275	1,268	1,421	1,382	1,590
Copper:					
Mine output, Cu content:					
By concentration or cementation	330,232	308,966	306,779	260,574	284,653
Leaching, electrowon	50,952	55,600	60,500	69,300	71,000
Total	381,184	364,566	367,279	329,874	355,653
Metal:					
Anode and blister	334,000 <sup>r</sup>	297,000 <sup>r</sup>	310,000 <sup>r</sup>	248,000 <sup>r</sup>	243,000
Refined:					
Primary	411,952	396,000	393,000 <sup>r</sup>	388,000 <sup>r</sup>	320,000
Secondary <sup>c</sup>	14,000	15,000	15,000	35,000	35,000
Total	425,952	411,000	408,000	423,000	355,000
Gold:					
Mine output, Au content kilograms	23,755	26,375	23,543	21,324	20,406
Metal, refined do.	22,050	24,074	25,749	23,594	22,177
Iron and steel:					
Iron ore, mine output:					
Gross weight thousand tons	11,475	11,325	8,783	9,941	11,265
Fe content do.	6,885	6,795	5,270	5,965	6,759
Metal:					
Pig iron do.	4,808	4,856	4,363	3,996	4,183
Direct-reduced iron do.	6,070	5,589	3,672 <sup>r</sup>	4,740 <sup>r</sup>	5,473
Total do.	10,878	10,445	8,035 <sup>r</sup>	8,736 <sup>r</sup>	9,656
Ferrous alloys, electric arc furnace: <sup>7</sup>					
Ferromanganese do.	80	91	60	39	56
Silicomanganese do.	114	108	74	73	81
Total do.	194	199	134	112	137
Crude steel do.	15,243	15,586	13,292	14,010 <sup>r</sup>	15,178
Rolled products <sup>8</sup> do.	11,319	11,747	11,185 <sup>r</sup>	11,639 <sup>r</sup>	12,484
Lead:					
Mine output, Pb content	125,656	137,975	136,413	138,707	139,348
Metal:					
Smelter:					
Primary <sup>9</sup>	111,136	143,223	143,523	128,241	137,482
Secondary <sup>c</sup>	110,000	110,000	110,000	110,000	110,000
Total <sup>e</sup>	221,000	253,000	254,000	238,000	247,000
Refined:					
Primary <sup>10</sup>	108,978	142,856	143,345	128,201	135,472
Secondary	110,000 <sup>r</sup>	110,000 <sup>r</sup>	110,000 <sup>r</sup>	110,000 <sup>r</sup>	110,000
Total <sup>e</sup>	219,000	253,000	253,000	238,000	245,000

See footnotes at end of table.



TABLE 1--Continued  
MEXICO: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	1999	2000	2001	2002	2003
METALS--Continued					
Manganese ore: <sup>11</sup>					
Gross weight	459,000	435,000	277,000	245,000	320,000
Mn content	169,107	156,117	99,751	88,358	114,550
Mercury, mine output, Hg content <sup>e</sup>	15	15	15	15	15
Molybdenum, mine output, Mo content	7,961	6,886	5,518	3,428	3,524
Silver:					
Mine output, Ag content kilograms	2,466,981	2,620,495	2,759,985	2,746,989	2,568,877
Metallurgical products, Ag content:					
In copper bars do.	357,017	276,438	283,539	208,360	236,468
Mixed gold and silver bars do.	259,715	249,136	195,086	183,383	193,453
Metal, refined, primary do.	1,596,876	2,037,131	2,330,811	2,500,652 <sup>r</sup>	2,310,283
Tin:					
Mine output, Sn content	4	4	8	1 <sup>r</sup>	2
Metal, smelter, primary	1,258	1,200	1,107	1,756	1,769
Tungsten, mine output, W content	11	--	--	--	--
Zinc:					
Mine output, Zn content	362,811	392,791	428,828	446,104	413,991
Metal, refined, primary	218,913	235,073	303,810	302,122	320,364
INDUSTRIAL MINERALS					
Abrasives, natural <sup>12</sup>	6,208	7,000 <sup>e</sup>	690	949	909
Barite	157,953	127,420	142,017	163,620	287,451
Cement, hydraulic thousand tons	29,413	31,677	29,966	31,069	32,000 <sup>e</sup>
Clays:					
Bentonite	208,611	269,730	415,133	488,215 <sup>r</sup>	464,056
Common	6,964,647	9,689,936	13,257,459	13,258,195	13,232,893
Fuller's earth	47,522	51,685	148,194	147,064 <sup>r</sup>	152,917
Kaolin	489,993	532,268	681,709	745,498	798,407
Diatomite	65,146	96,448	69,474	62,322	67,801
Feldspar	262,241	334,439	329,591	332,101	346,315
Fluorspar:					
Acid-grade thousand tons	323	335	343	343	409
Metallurgical-grade do.	234	300	276	279	347
Total do.	557	635	619	622	756
Graphite, natural, amorphous	27,781	30,330	21,442	14,065	8,730
Gypsum and anhydrite, crude (yeso)	6,953,756	5,654,060	6,237,056	6,739,834	6,986,491
Lime, hydrated and quicklime <sup>e</sup> thousand tons	6,500	6,500	6,500	6,500	6,500
Magnesium compounds:					
Magnesite	308	335	250	--	--
Magnesia <sup>13</sup>	70,631	76,470	37,565	40,194	37,215
Mica, all grades	971	1,658	648	456	506
Nitrogen, N content of ammonia	1,002,700	700,600	547,500	437,400 <sup>r</sup>	439,700
Perlite	61,596	68,702	80,297	85,703	194,463
Phosphate rock <sup>14</sup>	950,649	1,052,464	787,283	4,764	5,500
Salt, all types thousand tons	8,236	8,884	8,501	7,802	7,547
Sodium compounds: <sup>e</sup>					
Carbonate, soda ash, synthetic	290,000	290,000	290,000	290,000	290,000
Sulfate, natural, bloedite <sup>15</sup>	591,300	560,400	547,000	591,500	475,600
Stone, sand and gravel:					
Calcite, common	682,249	820,149	2,711,889	2,935,127 <sup>r</sup>	3,425,623
Dolomite	415,284	403,664	670,797	457,665	565,896
Limestone thousand tons	45,449	58,267	63,346	59,421	56,253

See footnotes at end of table.

TABLE 1--Continued  
MEXICO: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

(Metric tons unless otherwise specified)

Commodity <sup>2</sup>	1999	2000	2001	2002	2003
<b>INDUSTRIAL MINERALS--Continued</b>					
Stone, sand and gravel--Continued:					
Marble	744,377	1,034,529	4,155,745	3,615,728	3,529,274
Quartz, quartzite, glass sand (silica)	1,700,527	1,802,545	1,720,211	1,778,715	1,689,042
Sand thousand tons	58,912	67,491	67,712	63,576	62,060
Gravel do.	45,050	50,176	57,157	68,239	76,332
Strontium minerals, celestite	164,682	157,420	145,789	94,015	130,329
Sulfur, elemental, byproduct:					
Of metallurgy <sup>c</sup> thousand tons	474	474	572	575	575
Of petroleum and natural gas do.	856	851	878	887	1,055
Total <sup>e</sup> do.	1,330	1,330	1,450	1,460	1,630
Talc	18,981	20,569	77,650	111,621 <sup>r</sup>	114,870
Vermiculite	--	--	--	300	312
Wollastonite	44,126	30,836	39,830	42,756	51,944
<b>MINERAL FUELS AND RELATED MATERIALS</b>					
Coal:					
Run of mine: thousand tons					
Metallurgical do.	4,748	6,372	5,242	5,097	4,775
Steam do.	8,555	7,915	6,935	6,308	6,530
Total do.	13,303	14,287	12,177	11,405	11,305
Washed metallurgical coal <sup>c</sup>	1,944 <sup>3</sup>	2,259 <sup>3</sup>	2,000	2,000	2,000
Coke: <sup>16</sup>					
Metallurgical do.	2,187	2,185	2,025	1,412	1,414
Breeze do.	41	50	40	39	49
Total do.	2,228	2,235	2,065	1,451	1,463
Gas, natural:					
Gross million cubic meters	49,506	48,349	46,624	45,716	46,509
Marketed do.	27,999	28,847	28,984	30,139	31,000 <sup>e</sup>
Petroleum:					
Crude thousand 42-gallon barrels	1,060,690	1,099,380	1,141,355	1,159,642	1,230,415
Condensate, natural gas liquids do.	159,505	159,870	158,045	148,920	152,570
Total do.	1,220,195	1,259,250	1,299,400	1,308,562	1,382,985
Refinery products:					
Liquefied petroleum gas do.	11,315	9,089	10,147	11,425	12,410
Motor gasoline do.	148,117	143,445	142,423	145,343	162,425
Jet fuel do.	21,097	20,185	20,696	20,696	21,900
Kerosene do.	292	110	110	--	--
Distillate fuel oil, diesel do.	99,244	96,871	102,784	97,419	112,420
Lubricants do.	3,030	2,190	1,898	1,789	1,825
Residual fuel oil do.	156,184	154,249	159,104	164,104	144,905
Asphalt do.	11,060	11,352	10,476	10,512	9,490
Other, refinery fuel and losses do.	18,394	17,263	14,854	14,416	5,840
Total do.	468,733	454,754	462,492	465,704	471,215

<sup>e</sup>Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. <sup>r</sup>Revised. -- Zero.

<sup>1</sup>Table includes data available through September 30, 2004.

<sup>2</sup>In addition to the commodities listed, additional types of crude construction materials are produced, but output is not reported; available information is inadequate to make estimates of output levels.

<sup>3</sup>Reported figure.

<sup>4</sup>Sb content of antimonial lead and impure bars plus refined metals.

<sup>5</sup>Arsenic content of white and black (impure) arsenic trioxide.

<sup>6</sup>Refined metal plus bismuth content of impure smelter products.

<sup>7</sup>Reported by Cámara Nacional del Hierro y del Acero.

<sup>8</sup>Includes flat, nonflat, and seamless pipe steel products.

<sup>9</sup>Lead content of impure bar, antimonial lead, and refined metal.

<sup>10</sup>Includes lead content of antimonial lead.

TABLE 1--Continued  
MEXICO: PRODUCTION OF MINERAL COMMODITIES<sup>1</sup>

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<sup>11</sup>Mostly oxide nodules; includes smaller quantities of direct-shipping carbonates and oxide ores for metallurgical and battery applications.

<sup>12</sup>Based on exports comprising mostly pumice stone and emery (a granular, impure variety of corundum).

<sup>13</sup>Reported by Industrias Peñoles, S.A. de C.V. as the only major producer. Includes caustic, electromelt, hydroxide, and refractory.

<sup>14</sup>Includes only output used to manufacture fertilizers.

<sup>15</sup>Series reflects output reported by Industrias Peñoles, S.A. de C.V. plus an additional 40,000 tons of estimated output by other producers.

<sup>16</sup>Includes coke made from imported metallurgical coal.

TABLE 2  
MEXICO: STRUCTURE OF THE MINERAL INDUSTRY IN 2003

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities <sup>1</sup>	Annual capacity
Aluminum	Aluminio y Derivados de Veracruz, S.A. de C.V. (private Mexican, 100%)	Smelter in Veracruz, Ver.	65.
Antimony	Cía. Minera y Refinadora Mexicana, S.A. (private Mexican, 51%, and Cookson Ltd., 49%)	San Jose Mine, Catorce, S.L.P.	365.
Barite	Barita de Sonora, S.A. [Grupo Acerero del Norte, S.A. de C.V. (GAN), 100%]	Mazatan, Son.	219.
Bismuth	Met-Mex Peñoles, S.A. de C.V. (Industrias Peñoles, S.A. de C.V., 100%)	Torreon, Coah.	1.2.
Do.	Minerales y Arcillas, S.A. de C.V. (private Mexican, 100%)	San Francisco del Huerto Mine in San Pedro, Coah., La Escondida and Angelita Mines and plant in Galeana	55.
Do.	Barita de Santa Rosa, S.A. de C.V. (private Mexican, 100%)	Muzquiz, Coah.	256.
Cement	Cementos Mexicanos, S.A. de C.V. (CEMEX) (private Mexican, 100%)	Ensenada, B.C.N.; Torreon, Coah.; Barrientos, D.F.; Arotonilco and Huichapan, Hgo.; Guadalajara and Zapotilic, Jal.; Hidalgo and Monterrey, N.L.; Tepeaca, Pue.; Tamuin and Valles, S.L.P.; Hermosillo and Yaqui, Son.; and Merida, Yuc.	26,650.
Do.	Cementos Apasco, S.A. de C.V. (Holcim Group, 49%, and other, 51%)	Apasco, Mex.; Ramos Arizpe, Coah.; Macuspana, Tab.; Tecoman, Col.; Orizaba, Ver.; Acapulco, Gro.	8,900.
Do.	Cooperativa La Cruz Azul, S.C.L. (private Mexican, 100%)	Cruz Azul, Hgo., Lagunas, Oax.	5,000.
Do.	Cementos de Chihuahua, S.A. de C.V. [Cementos Mexicanos, S.A. de C.V. (CEMEX), 36%, and private Mexican, 64%]	Chihuahua, Ciudad Juarez, and Samalayuca, Chih.	2,000.
Coal	Minerales de Monclova, S.A. [Altos Hornos de Mexico, S.A. de C.V. (AHMSA), 100%]	Mimosa and Palau Mines and Muzquiz washing plant at Palau, Coah., and coking plant at Monclova, Coah.	3,000.
Do.	Carbonifera de San Patricio, S.A. de C.V. (private Mexican, 100%)	Progreso, Coah.	1,314.
Do.	Industrial Minera México, S.A. de C.V. [(IMMSA) (Grupo México, S.A. de C.V., 90%)]	Nueva Rosita, Coah.	1,500.
Do.	Minera Carbonifera Río Escondido, S.A. [Grupo Acerero del Norte, S.A. de C.V. (GAN), 51%, and Mission Energy, 49%]	Mina I, Mina II, and Tajo I at Nava and Piedras Negras, Coah.	4,000.
Copper	Mexicana de Cobre, S.A. de C.V. (Grupo México, S.A. de C.V., 90%)	La Caridad Mine, smelter, refinery, and rod plant at Nacozari de Garcia, Son.	350 smelter, 50 SX-EW, <sup>2</sup> 300 refinery, 150 rod plant.
Do.	Mexicana de Cananea, S.A. de C.V. (Grupo México, S.A. de C.V., 90%)	Mine and smelter at Cananea, Son.	29,200 mill, 33 SX-EW. <sup>2</sup>

See footnotes at end of table.

TABLE 2--Continued  
MEXICO: STRUCTURE OF THE MINERAL INDUSTRY IN 2003

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities <sup>1</sup>	Annual capacity
Ferroalloys		Cía. Minera Autlán, S.A. de C.V. (Grupo Ferrominero, S.A. de C.V., 54%; Minas de Basis, S.A. de C.V., 32%; BHP Ltd., 14%)	Plant in Tamos, Ver.	140.
Do.		do.	Plant in Teziutlan, Pue.	38.
Do.		do.	Plant in Gomez Palacio, Dgo.	35.
Fluorspar		Cía. Minera Las Cuevas, S.A. de C.V. (Grupo Industrial Camesa, S.A. de C.V.) <sup>3</sup>	Salitera (Zaragoza), S.L.P.	520.
Do.		Fluorita de México, S.A. de C.V. (Corp. Alfil, 51%, and Applied Industrial Minerals Corp., 49%)	Mines at La Encantada district and plant at Muzquiz, Coah.	150.
Gold	kilograms	Cía. Fresnillo, S.A. de C.V. (Industrias Peñoles, S.A. de C.V., 100%)	Fresnillo/Proano Mine, Zac.	1,000.
Do.	do.	Minera Piedmont S. de R.L. de C.V. (Industrias Peñoles, S.A. de C.V., 56%, and Newmont Mining Corporation, 44%)	La Herradura Mine, Son.	6,300.
Do.	do.	Minera Mexicana La Ciénega, S.A. de C.V. (Industrias Peñoles, S.A. de C.V.)	La Cienega Mine, Dgo.	3,700.
Do.	do.	Minas Luismín, S.A. de C.V. (Wheaton River Minerals Ltd., 100%)	Tayoltita and Santa Rita, Dgo.; San Antonio, Sin; San Martin, Qro.; La Guitarra, Mex.	2,700.
Do.	do.	Cía. Minera de Santa Gertrudis (Grupo Ariztegui, 51%, and Phelps Dodge Corp., 49%)	Santa Gertrudis Mine, Son.	1,600.
Do.	do.	Exploraciones El Dorado, S.A. de C.V., 70%, and Minerales Sotula, 30%	La Colorada Mine, Son.	800.
Do.	do.	Cía. Minera las Torres, S.A. de C.V. (Industrias Peñoles, S.A. de C.V., 100%)	Guanajuato, Gto.	438.
Do.	do.	Cía. Minera El Cubo, S.A. de C.V. (private Mexican, 100%)	do.	128.
Do.	do.	Sociedad Cooperativa Minero Metalúrgica Santa Fe de Guanajuato (private Mexican, 100%)	Guanajuato, Gto.	438.
Do.	do.	Met-Mex Peñoles, S.A. de C.V. (Industrias Peñoles, S.A. de C.V., 100%)	Torreon, Coah.	22,700 refinery.
Graphite		Grafitos Mexicanos, S.A. (Cummings Moore Graphite Co. of the United States, 25%, and private Mexican, 75%)	Lourdes and San Francisco Mines, Son.	60.
Do.		Grafito Superior, S.A. de C.V. (Superior Graphite Co., 100%)	Covalmar, Santa Clara, and Rio Mayo Mines, and plant in Son.	25.
Gypsum		Cía. Occidental Mexicana, S.A. (private Mexican, 51%, and Domtar, Ltd., of Canada, 49%)	Santa Rosalia on San Marcos Island, B.C.S.	2,500.
Iron ore		Consorcio Minero Benito Juárez Peña Colorada, S.A. de C.V. (Hylsamex, S.A. de C.V., 51%, and Ispat International N.V., 49%)	Peña Colorada mine and pellet plant near Manzanillo, Col.	3,500.
Do.		Altos Hornos de Mexico, S.A. de C.V. (AHMSA) [Grupo Acerero del Norte, S.A. de C.V. (GAN), 74%]	La Perla Mine, Chih.; Hercules Mine, Coah.; and Cerro de Mercado Mine, Dgo.	5,000.
Do.		Siderúrgica Lázaro Cárdenas-Las Truchas, S.A. de C.V. (SICARTSA) (Grupo Villacero, 100%)	Ferrotepec, Volcan, and Mango deposits in Las Truchas project area and pellet plant, Mich.	2,350.

See footnotes at end of table.

TABLE 2--Continued  
MEXICO: STRUCTURE OF THE MINERAL INDUSTRY IN 2003

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners		Location of main facilities <sup>1</sup>	Annual capacity
Iron ore--continued.	Hylsamex, S.A. de C.V. (Grupo Industrial ALFA, 100%)		San Ramon and Aquila Mines	1,500.
Lead and zinc	Industrial Minera México, S.A. de C.V. [(IMMSA) (Grupo México, S.A. de C.V., 90%)]		Charcas, S.L.P.; San Martín, Zac.; Santa Eulalia, Chih.; Taxco, Gro.; Rosario, Sin.; Santa Barbara, Chih.; Velardena, Dgo; lead refinery at Monterrey, N.L.; zinc refinery at S.L.P.	70 lead, 110 refined zinc.
Do.	Industrias Peñoles, S.A. de C.V. (private Mexican, 97%, and private U.S., 3%)		Mines at La Encantada, Coah.; Fresnillo, Zac.; Naica, Chih.; Bismark, Son; Rey de Plata, Gro. (Penoles, 51%; Dowa Mining Co., 39%); metallurgical complex at Torreon, Coah., with silver, lead, and zinc smelter and refineries operated by Met-Mex Peñoles (Peñoles, 100%)	180 refined lead, 220 refined zinc.
	do.		Francisco I. Madero Mine, Zac.	100,000 zinc.
Do.	Minera San Francisco del Oro, S.A. de C.V. (Empresas Frisco, S.A. de C.V., 100%)		San Francisco del Oro, near Hidalgo del Parral, Chih.	15 lead, 21 zinc.
Do.	Minera Real de Angeles, S.A. de C.V. (Empresas Frisco, S.A. de C.V., 100%)		Noria de Angeles, Zac.	45 lead, 47 zinc.
Manganese	Cía. Minera Autlán, S.A. de C.V. (Grupo Ferrominero, S.A. de C.V., 81.75%, and private Mexican, 18.25%)		Molango, Naopa, and Nonoalco Mines, Hgo.	600 ore and concentrate.
Molybdenum	Mexicana de Cobre, S.A. (Grupo México, S.A. de C.V., more than 90%)		La Caridad Mine and molybdenum plant, Son.	6.
Petroleum <sup>4</sup> thousand barrels per day	Petróleos Mexicanos, S.A. de C.V. (PEMEX) (Government, 100%)		Comalcalco, Poza Rica, Ver., and Gulf of Campeche, Cam., Districts	3,500.
Salt	Exportadora de Sal, S.A. (Fideicomiso de Fomento 51%, and Mitsubishi Corp., 49%)		Solar salt complex at Guerrero Negro, B.C.S.	6,000.
Silver kilograms	Industrias Peñoles, S.A. de C.V. (private Mexican, 97%, and private U.S., 3%) <sup>5</sup>		Naica, Chih.; Fresnillo, Zac.; Las Torres, Gto.; La Cienega, Dgo.; Tizapa, Gro.; La Encantada, Coah.; and other locations	750,000.
Do.	do.	Cía. Fresnillo, S.A. de C.V. (Industrias Peñoles, S.A. de C.V., 100%)	Fresnillo/Proano Mine, Zac.	950,000.
Do.	do.	Industrial Minera México, S.A. de C.V. [(IMMSA) (Grupo México, S.A. de C.V., 90%)]	San Martín Mine, Sombrerete, Zac.; Taxco, Gro.; Charcas, S.L.P.; Santa Eulalia, Chih.; refinery at Monterrey, N.L.	335,000.
Do.	do.	Minera Hecla, S.A. de C.V. (Hecla Mining Co.)	San Sebastian Mine and Verladena plant, Dgo.	130,000.
Do.	metric tons	do.	do.	450,000 mill.
Do.	kilograms	Met-Mex Peñoles, S.A. de C.V. (Industrias Peñoles, S.A. de C.V., 100%)	Torreon, Coah.	1,240,000 refinery.
Do.	do.	Pan American Silver Corp.	La Colorada Mine, Zac.	24,300.
Sodium sulfate	Química del Rey, S.A. de C.V. (Industrias Peñoles, S.A. de C.V., 100%)		Plant at Laguna del Rey, Coah.	620.

See footnotes at end of table.

TABLE 2--Continued  
MEXICO: STRUCTURE OF THE MINERAL INDUSTRY IN 2003

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities <sup>1</sup>	Annual capacity
Steel	Altos Hornos de Mexico, S.A. de C.V. (AHMSA) [Grupo Acerero del Norte, S.A. de C.V. (GAN), 74%]	Steelworks at Monclova, Coah.	3,700 steel, 3,550 pellet.
Do.	Hylsamex, S.A. de C.V. (Grupo Industrial ALFA, 100%)	Steel works and direct-reduction units at Monterrey, N.L., and Puebla, Pue.; pelletizing plant in Col.	3,100 steel, 1,500 pellet.
Do.	DEACERO, S.A. de C.V. (private Mexican, 100%)	Steelworks at Saltillo, Coah., and Celaya, Gto.	1,450.
Do.	ISPAT Mexicana, S.A. de C.V. (Ispat International N.V., 100%)	SICARTSA II plant facilities at Lazaro Cárdenas, Mich.	5,300 steel, 4,000 pellet.
Do.	Siderúrgica Lázaro Cárdenas-Las Truchas, S.A. de C.V. (SICARTSA) (Grupo Villacero, 100%)	Port Lazaro Cardenas, Mich.	2350 steel, 1,850 pellet.
Do.	Tubos de Acero de México, S.A. (private Mexican, 100%)	Veracruz, Ver.	1,000.
Strontium (celestite)	Cía. Minera La Valenciana (private Mexican, 100%)	San Agustín Mine, Torreon, Coah.	50.
Sulfur	Petróleos Mexicanos, S.A. de C.V. (PEMEX)	Nationwide petroleum operations	890.
Tin <sup>5</sup>	Fundidora Marni, S.A.	San Luis Potosi, S.L.P.	NA.
Do.	PIZUTO, S.A.	do.	NA.

NA Not available.

<sup>1</sup>State abbreviations: Baja California Norte (B.C.N.), Baja California Sur (B.C.S.), Campeche (Cam.), Chihuahua (Chih.), Coahuila (Coah.), Colima (Col.), Distrito Federal (D.F.), Durango (Dgo.), Guanajuato (Gto.), Guerrero (Gro.), Hidalgo (Hgo.), Jalisco (Jal.), Mexico (Mex.), Michoacan (Mich.), Nuevo Leon (N.L.), Oaxaca (Oax.), Puebla (Pue.), Queretaro (Qro.), San Luis Potosi (S.L.P.), Sinaloa (Sin.), Sonora (Son.), Tabasco (Tab.), Veracruz (Ver.), Yucatan (Yuc.), and Zacatecas (Zac.).

<sup>2</sup>Solvent extraction-electrowinning.

<sup>3</sup>Grupo Industrial Camesa, S.A. de C.V. was owned by Banco Internacional (34%), Banco del Atlántico (34%), Banco Nacional de México, S.A. (17%), Noranda Inc. of Canada (4%), Free Float (12%).

<sup>4</sup>Petróleos Mexicanos, S.A. de C.V. operates six refineries with an installed capacity of 1.68 million barrels per day.

<sup>5</sup>Smelter output from mostly imported concentrates.